Report of Magnetical Observations at Falmouth Observatory for the Year 1895. Latitude 50° 9′ 0″ N. and Longitude 5° 4′ 35″ W.; height, 167 feet above mean sea-level.

These observations have been made by instruments purchased from the Government Grant Fund administered by the Royal Society.

The peculiar difficulties attending the proper working of the Vertical Force Magnet, reported in 1894, have not been overcome, and the results obtained are not sufficiently reliable for publication. The Committee contemplate approaching the Royal Society, with a view to having a new Vertical Force Magnet provided in place of the present defective instrument.

Photographic curves of Magnetic Declination and of Horizontal Force variations have been taken regularly throughout the past year, and the magnets have worked satisfactorily.

The scale values of the instruments were determined on 2nd January, 1896. The following values of the ordinates of the photographic curves were then found:—

Declination, 1 cm = 0° 11′·7.

Bifilar, for 1 cm. δ H., = 0·00050 C.G.S. unit.

The principal magnetic disturbances recorded during the year occurred on the following dates:—February 9, 10, 15, 16, March 13, 14, April 11, October 13, 14, 29, November 9, 10, 24.

Observations with the Absolute Instruments have been made monthly, of which the following is a summary:—

Determinations of	Horizontal Intensity,	38.
,,	Inclination,	37 sets of four.
,,	absolute Declination,	39.

Following the method adopted in the four previous years, it is intended that the observations be reduced, and that the Declination and Horizontal Force curves for five quiet days in each month of the year—selected by the Astronomer Royal—be tabulated and prepared for publication, in accordance with the International scheme. The results will be printed in the Royal Cornwall Polytechnic Society's Annual Report, and also in the "Proceedings" of the Royal Society.

The following are the principal results of the magnetic elements for the year 1894:—

Mean Westerly Declination,	18° 54′·5.
Mean Inclination,	67° 0′·4.
Mean Horizontal Force,	0·18547 C.G.S. unit.

The Declination and Horizontal Force are deduced from hourly readings of the photographic curves, and so are corrected for the diurnal variation.

The Inclination is the mean of the absolute observations, the mean time of which is 3 P.M.

In Table V, X is the mean of the absolute values observed during the month (generally three in number), uncorrected for diurnal variations and for any disturbance. Y is the mean of the products of the Dips and the X.

The results in the following tables, Nos. I, II, III, IV, are deduced from the magnetograph curves which have been standardised by observations of deflection and vibration. These were made with the Collimator Magnet marked 66A, and the Declinometer Magnet marked 66C in the Unifilar Magnetometer by Elliott Brothers, of London. Table No. V is deduced from these observations. The temperature correction (which is probably very small) has not been applied.

The Inclination was observed with the Inclinometer No. 86, by Dover, of Charlton, Kent, and needles 1 and 2, which are $3\frac{1}{2}$ ins. in length, the results of which appear in Table VI.

The Declination and Horizontal Force values given in Tables I to IV are prepared in accordance with the suggestions made in the fifth report of the Committee of the British Association on comparing and reducing magnetic observations, and the time given is Greenwich mean time, which is 20 min. 18 sec. earlier than local time.

The following is a list of the days during the year 1895 which were selected by the Astronomer Royal, as suitable for the determination of the magnetic diurnal variations, and which have been employed in the preparation of the magnetic tables:—

January	5, 13, 25, 26, 27.
February	4, 13, 22, 25, 26.
March	7, 11, 12, 24, 27.
April	2, 8, 21, 22, 29.
May	4, 12, 16, 19, 23.
June	8, 13, 14, 15, 26.
July	3, 7, 19, 24, 25
August	2, 3, 7, 22, 27.
September	2, 7, 8, 21, 28
October	3, 10, 18, 21, 22
November	7, 14, 17, 19, 21.
December	4, 5, 6, 16, 29.

The Azimuth of the fixed mark used in deducing the Observations of Absolute Declination was checked by Professor A. W. Rücker, M.A., F.R.S., on August 7, 1895, by means of an Observation of the

Sun's Azimuth, and determined as 1° 16′ 25″ E. of N., which agrees practically with the original determination of 1° 16′ 30″ E. of N., the value hitherto used.

The whole of the instruments have been maintained in good order. The Magnetic Chamber and the Magnetic Hut in the garden have been kept in a satisfactory state of dryness during the year, save for three days in December, when the Chamber was flooded owing to excessive rainfall.

EDWARD KITTO,
Magnetic Observer.

Table I.—Hourly Means of Declination at the Falmouth on five selected quiet Days in

(18° + West.)

Hours	Mid.	1	2	3	4	5	6	7	8	9	10	11
					Winter.							
1895. Months.	′	′	′	′	′	′	′	′	′	′	′	′
Jan. ..	56·1	56·4	57·0	56·9	56·9	56·9	56·8	56·3	56·0	56·5	56·9	57·4
Feb. ..	56·1	56·4	56·3	56·9	56·5	56·2	55·9	56·0	56·3	55·5	56·5	58·5
March .	55·6	55·6	55·8	55·8	55·8	55·4	55·4	54·7	53·0	52·5	54·4	57·2
Oct. ..	51·8	51·7	51·6	51·9	51·7	51·1	51·1	50·8	49·9	49·7	50·9	53·5
Nov. ..	52·4	52·7	53·1	53·3	53·4	53·2	52·7	52·8	52·5	51·6	52·2	53·4
*Dec. ..	51·1	51·6	51·9	52·1	51·9	51·7	51·6	51·3	51·1	51·0	52·0	52·9
Means	53·9	54·1	54·3	54·5	54·4	54·1	53·9	53·7	53·1	52·8	53·8	55·5
					Summer.							
	′	′	′	′	′	′	′	′	′	′	′	′
April..	55·7	56·0	55·7	54·9	54·9	54·7	53·6	52·5	51·8	52·2	54·4	57·4
May ..	53·7	53·2	52·7	52·8	52·3	51·5	50·4	50·1	50·2	51·1	53·4	56·8
June ..	51·3	51·1	51·0	51·0	50·2	48·8	46·8	45·2	45·2	46·6	49·6	53·2
July ..	52·8	52·5	51·8	51·6	51·7	51·0	48·9	47·9	48·1	49·1	51·1	54·3
Aug. ..	52·2	51·7	51·2	51·1	50·6	49·5	49·1	48·3	48·5	49·5	51·5	54·3
Sept. ..	52·9	53·3	53·5	53·2	52·9	52·3	51·4	50·3	49·1	49·5	51·9	54·7
Means	53·1	53·0	52·7	52·4	52·1	51·3	50·0	49·1	48·8	49·7	52·0	55·1

* Mean of four days, 4th, 5th, 6th, and 16th.

Table II.—Solar Diurnal Range of the Falmouth

Hours	Mid.	1	2	3	4	5	6	7	8	9	10	11
					Summer mean.							
	′	′	′	′	′	′	′	′	′	′	′	′
	−0·8	−0·9	−1·2	−1·5	−1·8	−2·6	−3·9	−4·8	−5·1	−4·2	−1·9	+1·2
					Winter mean.							
	′	′	′	′	′	′	′	′	′	′	′	′
	−1·1	−0·9	−0·7	−0·5	−0·6	−0·9	−1·1	−1·3	−1·9	−2·2	−1·2	+0·5
					Annual mean.							
	′	′	′	′	′	′	′	′	′	′	′	′
	−1·0	−0·9	−1·0	−1·0	−1·2	−1·8	−2·5	−3·1	−3·5	−3·2	−1·6	+0·9

NOTE.—When the sign is + the magnet

Observatory determined from the Magnetograph Curves each Month during the Year 1895.

Noon	1	2	3	4	5	6	7	8	9	10	11	Mid.
					Winter.							
′	′	′	′	′	′	′	′	′	′	′	′	′
58·7	59·3	59·0	58·1	58·1	57·6	57·5	57·0	56·8	56·4	56·3	56·3	56·6
60·8	62·3	62·3	61·1	59·7	59·1	58·9	58·3	57·8	57·2	56·7	56·5	56·3
60·7	62·5	63·0	61·1	59·4	57·9	57·0	56·2	56·1	56·0	56·3	55·6	55·8
56·2	57·4	56·8	55·7	53·9	52·8	52·9	52·8	52·4	51·8	52·0	51·5	51·7
55·2	55·8	56·0	55·5	54·8	54·1	54·0	53·5	53·3	52·7	52·0	52·3	51·9
54·3	54·8	54·2	53·7	53·0	52·4	51·6	51·6	51·5	51·2	51·2	51·5	51·5
57·7	58·7	58·6	57·5	56·5	55·7	55·3	54·9	54·7	54·2	54·1	54·0	54·0
					Summer.							
′	′	′	′	′	′	′	′	′	′	′	′	′
61·4	63·3	64·1	62·5	60·4	58·0	56·8	56·2	56·4	56·3	56·2	56·0	55·6
58·7	59·8	59·9	59·1	57·4	56·4	55·6	54·8	54·4	53·9	54·3	53·7	53·2
57·0	58·7	59·9	59·8	58·4	56·5	54·9	53·8	52·9	52·6	52·7	52·2	51·8
57·4	59·5	60·1	58·6	57·1	56·0	55·1	54·3	53·9	53·7	53·7	53·2	53·0
58·0	59·7	59·0	57·2	55·0	52·9	52·4	52·3	52·6	52·0	52·4	52·4	51·9
58·5	59·7	58·8	57·2	55·4	53·9	52·7	52·7	52·6	52·7	52·8	52·9	53·1
58·5	60·1	60·3	59·1	57·3	55·6	54·6	54·0	53·8	53·5	53·7	53·4	53·1

Declination as derived from Table I.

Noon	1	2	3	4	5	6	7	8	9	10	11	Mid.
					Summer mean.							
′	′	′	′	′	′	′	′	′	′	′	′	′
+4·6	+6·2	+6·4	+5·2	+3·4	+1·7	+0·7	+0·1	−0·1	−0·4	−0·2	−0·5	−0·8
					Winter mean.							
′	′	′	′	′	′	′	′	′	′	′	′	′
+2·7	+3·7	+3·6	+2·5	+1·5	+0·7	+0·3	−0·1	−0·3	−0·8	−0·9	−1·0	−1·0
					Annual mean.							
′	′	′	′	′	′	′	′	′	′	′	′	′
+3·1	+5·0	+5·0	+3·9	+2·5	+1·2	+0·5	0·0	−0·2	−0·6	−0·6	−0·8	−0·9

points to the west of its mean position.

Table III.—Hourly Means of the Horizontal Force at Falmouth on five selected quiet Days in

0·18000 + (C.G.S. units.)

Hours	Mid.	1	2	3	4	5	6	7	8	9	10	11
					Winter.							
1895. Months.												
Jan. ..	530	530	531	532	533	535	537	540	536	531	525	522
Feb. ..	534	533	533	533	535	537	539	538	536	531	523	516
March .	553	549	551	551	552	553	554	552	549	536	525	522
Oct. ..	560	557	556	556	558	557	555	556	551	541	531	529
Nov. ..	548	550	554	554	555	557	558	559	558	551	546	542
Dec. ..	555	555	556	559	561	562	564	565	563	559	550	547
Means	547	546	547	548	549	550	551	552	548	542	534	530
					Summer.							
April ..	550	548	546	543	540	540	540	535	528	518	508	501
May ..	554	554	549	548	548	547	544	539	530	523	516	522
June ..	555	551	550	550	549	547	542	535	526	519	515	516
July ..	558	558	559	558	556	553	547	543	537	528	522	521
Aug. ..	565	565	562	559	559	557	555	548	542	535	527	525
Sept. ..	550	549	550	549	549	550	549	544	535	524	519	520
Means	555	554	553	551	550	549	546	541	533	525	518	518

Table IV.—Diurnal Range of the Falmouth

(C.G.S. units.)

Hours	Mid.	1	2	3	4	5	6	7	8	9	10	11
					Summer mean.							
	+ ·00007	+ ·00006	+ ·00005	+ ·00003	+ ·00002	+ ·00001	− ·00002	− ·00007	− ·00015	− ·00023	− ·00030	− ·00030
					Winter mean.							
	+ ·00001	·00000	+ ·00001	+ ·00002	+ ·00003	+ ·00004	+ ·00005	+ ·00006	+ ·00002	− ·00004	− ·00012	− ·00016
					Annual mean.							
	+ ·00004	+ ·00003	+ ·00003	+ ·00003	+ ·00003	+ ·00003	+ ·00002	− ·00001	− ·00007	− ·00014	− ·00021	− ·00023

Note.—When the sign is + the

Observatory as determined from the Magnetograph Curves, each Month during the Year 1895.

Noon	1	2	3	4	5	6	7	8	9	10	11	Mid.
Winter.												
521	522	538	529	527	529	532	534	532	533	533	533	534
518	525	532	534	533	533	539	544	546	546	544	541	538
525	531	537	543	546	550	552	556	558	558	558	559	558
534	540	545	551	551	554	558	559	558	559	559	559	560
544	546	550	552	555	559	561	561	562	561	560	557	556
548	551	550	553	554	556	559	561	561	560	561	560	559
532	536	542	544	544	547	550	553	553	553	553	552	551
Summer.												
511	520	533	538	544	546	552	553	556	556	557	558	555
530	539	544	551	557	563	570	569	569	564	561	560	557
524	534	545	553	561	566	567	570	570	572	566	563	561
530	542	551	561	563	571	575	573	574	573	573	572	572
532	542	552	556	558	559	563	566	569	567	563	565	563
528	536	541	544	546	550	551	555	557	556	556	556	556
526	536	544	551	555	559	563	564	566	565	563	562	561

Horizontal Force as deduced from Table III.

Noon	1	2	3	4	5	6	7	8	9	10	11	Mid.
Summer mean.												
− ·00022	− ·00012	− ·00004	+ ·00003	+ ·00007	+ ·00011	+ ·00015	+ ·00016	+ ·00018	+ ·00017	+ ·00015	+ ·00014	+ ·00013
Winter mean.												
− ·00014	− ·00010	− ·00004	− ·00002	− ·00002	+ ·00001	+ ·00004	+ ·00007	+ ·00007	+ ·00007	+ ·00007	+ ·00006	+ ·00005
Annual mean.												
− ·00018	− ·00011	− ·00004	+ ·00001	+ ·00003	+ ·00006	+ ·00010	+ ·00012	+ ·00013	+ ·00012	+ ·00011	+ ·00010	+ ·00009

reading is above the mean.

Table V.—Magnetic Intensity. Falmouth Observatory, 1895.

1895.	C.G.S. measure.	
	X or Horizontal force.	Y or Vertical force.
January	0·18506	0·43608
February	0·18519	0·43628
March	0·18523	0·43655
April	0·18518	0·43612
May	0·18526	0·43652
June	0·18533	0·43573
July	0·18534	0·43593
August	0·18517	0·43588
September	0·18529	0·43588
October	0·18525	0·43780
November	0·18519	0·43780
December.	0·18555	0·43815
Means	0·18525	0·43656

Table VI.—Observations of Magnetic Inclination. Falmouth Observatory, 1895.

Month.		Mean.	Month.		Mean.
		° ′ ·5			° ′ ·7
January	11	67 0·5	July	4	66 56·7
	21	67 0·0		25	66 58·7
				30	66 58·6
		67 0·3			
					66 58·0
February	4	66 59·9			
	18	67 0·5	August	6	66 58·0
	27	66 59·5		7	66 58·6
				9	66 58·0
		67 0·0		10	67 1·6
				12	67 0·6
March	8	67 0·2		30	66 57·3
	18	67 2·4			
	29	66 58·9			66 59·0
		67 0·5	September	10	66 57·8
				28	66 58·5
April	9	67 0·2			
	20	66 59·8			66 58·2
	30	66 58·9			
			October	8	67 3·4
		66 59·6		18	67 3·6
				30	67 4·7
May	11	67 0·9			
	20	66 58·1			67 3·9
	30	67 1·7			
			November	12	67 4·5
		67 0·2		20	67 2·8
				29	67 5·5
June	8	66 57·3			
	21	66 58·6			67 4·3
	28	66 56·7			
			December	10	67 3·6
		66 57·5		21	67 2·8
				30	67 2·2
					67 2·9